CLAIM CHART

**U.S. PATENT NO. 7,980,998 – CLAIM 1**

Claimed Limitation	Patent Specification	Corresponding Structure in Accused Systems – Garmin Venu® 3
1. A personal device for measuring a training activity of a trainee having a body part which moves and changes its location and orientation, during said training activity, this movement at least partially defining said training activity, said device comprising:		Garmin sells the Venu 3. The Venu 3 is a wearable training device. **Source: (**Garmin Venu 3 Overview) The Garmin Venu 3 will track a training activity such as swimming. The Garmin Venu 3 tracks at least swim intervals and lengths. This is consistent with Fig. 5 of the '980 patent which considers a covered device tracking the elapsed time of a swimmer which is the equivalent of a swim length:

Going for a Pool Swim

NOTE: The touchscreen is not available during swim activities.

1 Press (A).
2 Select **Pool Swim**.
3 Select your pool size, or enter a custom size.
4 Press (A) to start the activity timer.
5 Start your activity.
   The watch automatically records swim intervals and lengths.
6 Press (B) when you rest.
   The rest screen appears.
7 Press (B) to restart the interval timer.
8 After you complete your activity, press (A) to stop the activity timer.
9 Select an option:
   • To save the activity, hold (A).
   • To discard the activity, hold (B).

Swim Terminology

Length: One trip down the pool.

Interval: One or more consecutive lengths. A new interval starts after a rest.

Stroke: A stroke is counted every time your arm wearing the watch completes a full cycle.

Swolf: Your swolf score is the sum of the time for one pool length and the number of strokes for that length. For example, 30 seconds plus 15 strokes equals a swolf score of 45. For open water swimming, swolf is calculated over 25 meters. Swolf is a measurement of swimming efficiency and, like golf, a lower score is better.

Source: (Garmin Venu 3 Owner's Manual, p.7)

Garmin lists the Venu 3 as one of its "Swimming Smartwatches." Garmin states that the Venu 3 provides "personalized data that's going to help your form." Below is a picture from Garmin's website showing a Garmin smartwatch attached to a swimmer's wrist. The Venu 3 records its location to determine when a stroke has been completed.
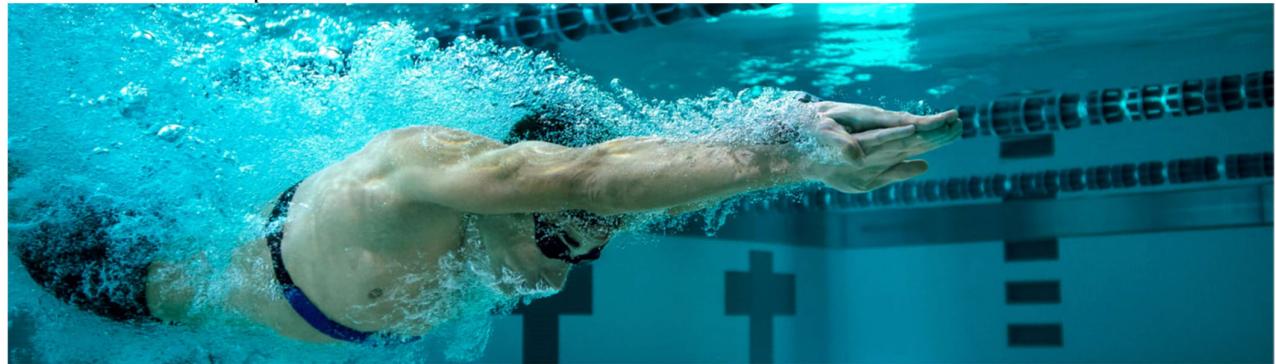
Swimming Smartwatches

Whether you feel at home in the pool or open water, you want personalized data that's going to help your form. Our swimming smartwatches keep up with you every lap.

**Source:** (Garmin Swimming Smartwatches)

| (a) a sensing unit adapted to repeatedly measure, during said training activity, parameters associated with the movement of said body part and characterizing the location and orientation of said body part relative to its initial location and orientation, | | The Garmin Venu 3 contains sensors, comprising a sensing unit, within the watch body of the device. The Garmin Venu 3 can count a swimming stroke every time a user's arm wearing the watch completes a full cycle. The Garmin Venu 3's Move IQ can detect familiar exercise patterns.

 Sensors

 GPS ✔
 GLONASS ✔
 GALILEO ✔
 GARMIN ELEVATE™ WRIST HEART RATE MONITOR ✔
 PULSE OX BLOOD OXYGEN SATURATION MONITOR ✔
 BAROMETRIC ALTIMETER ✔
 COMPASS ✔
 GYROSCOPE ✔
 ACCELEROMETER ✔
 THERMOMETER yes (tempe™ sensor required)
 AMBIENT LIGHT SENSOR ✔

 Source: (Garmin Venu 3 Specs)

 Stroke: A stroke is counted every time your arm wearing the watch completes a full cycle.
 Source: (Garmin Venu 3 Owner's Manual, p.7)

 Move IQ°
 When your movements match familiar exercise patterns, the Move IQ feature automatically detects the event and displays it in your timeline. The Move IQ events show activity type and duration, but they do not appear in your activities list or newsfeed.
 Source: (Garmin Venu 3 Owner's Manual, p.39) |
| (b) and wherein said sensing unit comprising at least accelerometer means, | | The Garmin Venu 3's sensing unit has an accelerometer means. The accelerometer of the Garmin Venu 3 is located within the watch body of the device. |

		Indoor Activities The watch can be used for training indoors, such as running on an indoor track or using a stationary bike or indoor trainer. GPS is turned off for indoor activities (*Activities and App Settings*, page 19). When running or walking with GPS turned off, speed and distance are calculated using the accelerometer in the watch. The accelerometer is self-calibrating. The accuracy of the speed and distance data improves after a few outdoor runs or walks using GPS. **TIP:** Holding the handrails of the treadmill reduces accuracy. When cycling with GPS turned off, speed and distance data are not available unless you have an optional sensor that sends speed and distance data to the watch, such as a speed or cadence sensor. **Source:** (Garmin Venu 3 Owner's Manual, p.4)
(c) a compass and		The Garmin Venu 3 contains a compass within the watch body of the device. **Compass** The watch has a 3-axis compass with automatic calibration. The compass features and appearance change depending on your activity, whether GPS is enabled, and whether you are navigating to a destination. **Calibrating the Compass Manually** **NOTICE** Calibrate the electronic compass outdoors. To improve heading accuracy, do not stand near objects that influence magnetic fields, such as vehicles, buildings, and overhead power lines. Your watch was already calibrated at the factory, and the watch uses automatic calibration by default. If you experience irregular compass behavior, for example, after moving long distances or after extreme temperature changes, you can manually calibrate the compass. 1 Hold Ⓑ. 2 Select **Settings** > **Watch Sensors** > **Compass** > **Start Calibration**. 3 Follow the on-screen instructions. **TIP:** Move your wrist in a small figure eight motion until a message appears. **Source:** (Garmin Venu 3 Owner's Manual, p.52)
(d) optionally gyroscope means,		The Garmin Venu 3 contains a gyroscope.

		Sensors GPS — ✔ GLONASS — ✔ GALILEO — ✔ GARMIN ELEVATE™ WRIST HEART RATE MONITOR — ✔ PULSE OX BLOOD OXYGEN SATURATION MONITOR — ✔ BAROMETRIC ALTIMETER — ✔ COMPASS — ✔ GYROSCOPE — ✔ ACCELEROMETER — ✔ THERMOMETER — yes (tempe™ sensor required) AMBIENT LIGHT SENSOR — ✔ **Source:** (Garmin Venu 3 Specs)
(e) said accelerometer means being adapted to measure linear acceleration of said body part along three axes,		Garmin states that the accelerometer of the Venu 3 measures at least speed, distance, and cadence. An accelerometer is defined by Dictionary.com as, "an instrument for measuring acceleration, as of aircraft or guided missiles." As shown below, Garmin's accelerometers, including the accelerometer in the Garmin Venu 3, measure acceleration along three axes. The axes are labeled X, Y, and Z in the explanatory diagram provided by Garmin below. By measuring the acceleration of the accelerometer located within the Venu 3, the Venu 3 can measure the acceleration of the arm that it is attached to.
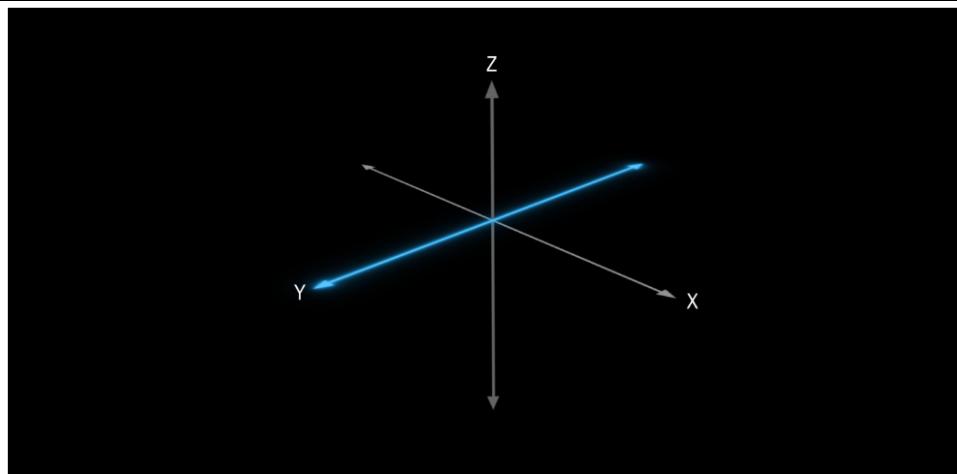
Gyroscope   Accelerometer   Electronic Compass   Barometer

Accellerometers measure acceleration, both an object's 'motion acceleration' or the 'gravitational acceleration' exerted by the earth. Because gravitational acceleration does not change rapidly over time, accelerometers are often used to calibrate gyrocopes. Motion acceleration can be used to calculate an object's displacement and velocity. When an sensor is in freefall, its motion acceleration and gravitational acceleration cancel each other out to produce a reading of zero. Gravitational acceleration readings are often used to calculate slope gradients.

Source: (Garmin Multi Sensor Accelerometer)

Indoor Activities

The watch can be used for training indoors, such as running on an indoor track or using a stationary bike or indoor trainer. GPS is turned off for indoor activities (*Activities and App Settings*, page 19).

When running or walking with GPS turned off, speed and distance are calculated using the accelerometer in the watch. The accelerometer is self-calibrating. The accuracy of the speed and distance data improves after a few outdoor runs or walks using GPS.

TIP: Holding the handrails of the treadmill reduces accuracy.

When cycling with GPS turned off, speed and distance data are not available unless you have an optional sensor that sends speed and distance data to the watch, such as a speed or cadence sensor.

Source: (Garmin Venu 3 Owner's Manual, p.4)

(f) said gyroscope means being adapted to measure angular acceleration of said body part around said three axes, and said parameters being at least linear and angular acceleration values;		The gyroscope of the Garmin Venu 3 measures angular acceleration of the watch. As the watch is connected to the trainee's arm, it will measure the angular acceleration of the body part. As shown below, the gyroscopes in Garmin watches, including the Garmin Venu 3, measure angular acceleration around three axes.
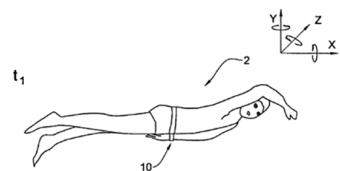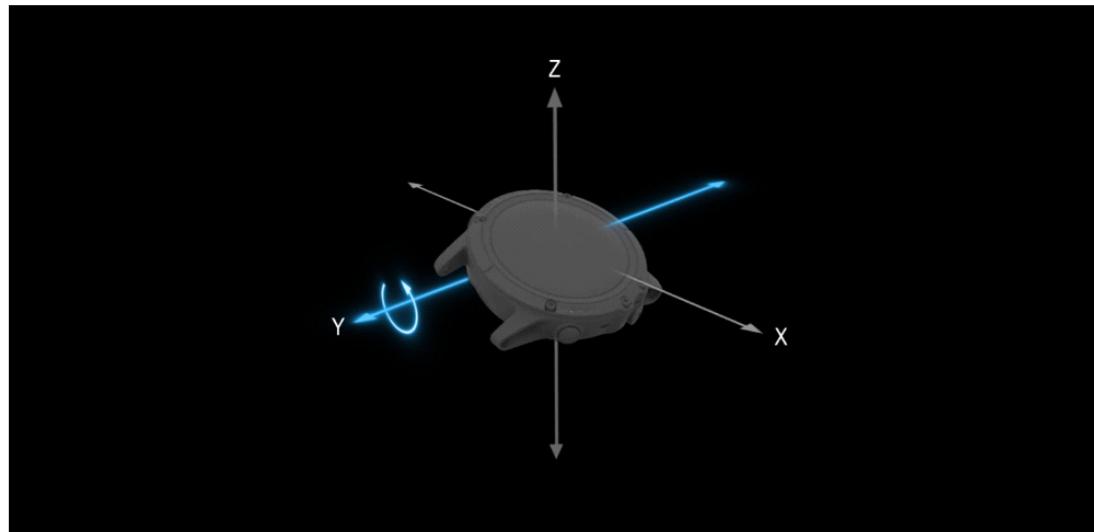
A gyrocope detects changes in gravitational force across three axes, making it a useful tool for measuring angular momentum. Angular momentum occurs along a vector, a direction of movement, defined as the product of a body's rotational inertia and angular speed about a particular axis. Thus, angular momentum is proportional to rotational inertia and angular speed. Angular speed, in turn, is different from plain 'speed', rather it is a scalar measure of rotation rate. As such, without rotation, there is no angular speed. If a body is rotating on the x axis, but the y and z axes values are 0, then the figure for the x axis constitutes angular speed and from this we can derive the 'angle' of movement.

Because of their usefulness in measuring orientation, gyroscopes are widely used in navigational systems for boats and airplanes, as well as weapons navigation systems. In contrast to traditional gyroscopes, most electronic gyroscopes in use today use Coriolis Force and simple harmonic oscillation to derive their results. Gyroscopes are used across a variety of sensor, stabilization and measurement systems, as well as the cell phones and wearable devices we use every day.

Source: (Garmin Multi Sensor Gyroscope)

(g) means for attaching the sensing unit to said body part; and		As shown below, the Garmin Venu 3 provides bands which attach the Venu 3 watchface to the user's wrist. The sensing units of the Garmin Venu 3 are located within the watchface. A band for attaching the sensing unit to the wrist is the preferred embodiment of the '980 patent, "For example, the interface **62** may comprise an elastic and/or adjustable band, for wrapping around the wrist." '980 Patent Col. 8 ll. 38-40. **Changing the Bands** The watch is compatible with standard quick-release bands. Venu 3S has 18 mm wide bands, and Venu 3 has 22 mm wide bands. 1 Slide the quick-release pin on the spring bar to remove the band. 2 Insert one side of the spring bar for the new band into the watch. 3 Slide the quick-release pin, and align the spring bar with the opposite side of the watch. 4 Repeat steps 1 through 3 to change the other band. **Source:** (Garmin Venu 3 Owner's Manual, p.73)

| (h) a processor adapted to receive from the sensing unit said parameters, and to calculate based thereon, data indicative of said training activity, said data including at least the location and orientation of said body part for each of the measurements. | | The Garmin Venu 3 contains a processor located within the watch body that receives and performs calculations on the data received from the sensing units. As shown below, Garmin's Move IQ compares received information pertaining to the location and orientation of the watch to detect and record when the user is performing a particular activity.

The Venu 3 tracks and counts reps of an exercise completed and determines which exercise is completed based on the data recorded for the location and orientation on the arm. The Venu 3 can also record data such as "Strokes/length" for the swimming exercise which is also determined by the location and orientation of the arm during the swim.

Move IQ
When your movements match familiar exercise patterns, the Move IQ feature automatically detects the event and displays it in your timeline. The Move IQ events show activity type and duration, but they do not appear in your activities list or newsfeed.
Source: (Garmin Venu 3 Owner's Manual, p.39)

Activity Tracking Settings
Hold Ⓑ, and select **Settings** > **Activity Tracking**.
Status: Turns off the activity tracking features.
Move IQ: Allows you to turn on and off Move IQ events.
Auto Activity Start: Allows your watch to create and save timed activities automatically when the Move IQ feature detects you are walking or running. You can set the minimum time threshold for running and walking.
Intensity Minutes: Allows you to set a heart rate zone for moderate intensity minutes and a higher heart rate zone for vigorous intensity minutes. You can also select Auto to use the default algorithm.
Turning Off Activity Tracking
When you turn off activity tracking, your steps, floors climbed, intensity minutes, sleep tracking, and Move IQ events are not recorded.
1 From the watch face, hold Ⓑ.
2 Select **Settings** > **Activity Tracking** > **Status** > **Off**.
Source: (Garmin Venu 3 Owner's Manual, p.39) |

Swimming Features

OPEN-WATER SWIM METRICS (DISTANCE, PACE, STROKE COUNT/RATE, STROKE DISTANCE, SWIM EFFICIENCY (SWOLF), CALORIES)	✔
POOL SWIM METRICS (LENGTHS, DISTANCE, PACE, STROKE COUNT, SWIM EFFICIENCY (SWOLF), CALORIES)	✔
STROKE TYPE DETECTION (FREESTYLE, BACKSTROKE, BREASTSTROKE, BUTTERFLY) (POOL SWIM ONLY)	✔
BASIC REST TIMER (UP FROM 0) (POOL SWIM ONLY)	✔
AUTO REST (POOL SWIM ONLY)	✔
TIME AND DISTANCE ALERTS	✔
UNDERWATER WRIST-BASED HEART RATE	✔

Source: (Garmin Venu 3 Specs)

Apps and Activities

Your watch includes a variety of preloaded apps and activities.

Apps: Apps provide interactive features for your watch, such as saving your location or calling someone from your watch (*Apps, page 16*).

Activities: Your watch comes preloaded with indoor and outdoor activity apps, including running, cycling, strength training, golfing, and more. When you start an activity, the watch displays and records sensor data, which you can save and share with the Garmin Connect community.

For more information about activity tracking and fitness metric accuracy, go to garmin.com/ataccuracy.

Connect IQ™ Apps: You can add features to your watch by installing apps from the Connect IQ app (*Downloading Connect IQ Features, page 66*).

Source: (Garmin Venu 3 Owner's Manual, p.3)

		Recording a Strength Training Activity
		You can record sets during a strength training activity. A set is multiple repetitions (reps) of a single move.
		1 Press Ⓐ.
		2 Select **Strength**.
		3 Press Ⓐ to start the activity timer.
		4 Start your first set.
		   By default, the watch counts your reps. Your rep count appears when you complete at least four reps. You can disable rep counting in the activity settings (*Activities and App Settings*, page 19).
		   TIP: The watch can only count reps of a single move for each set. When you want to change moves, you should finish the set and start a new one.
		5 Press Ⓑ to finish the set.
		   The watch displays the total reps for the set. After several seconds, the rest timer appears.
		6 If necessary, edit the number of reps, and select ✎ to add the weight used for the set.
		7 When you are done resting, press Ⓑ to start your next set.
		8 Repeat for each strength training set until your activity is complete.
		9 After you complete your activity, press Ⓐ, and select ✔.
		Source: (Garmin Venu 3 Owner's Manual, p.5)
		
		Avg. Stks./Len.: The average number of strokes per length during the current activity.
		Avg. Stroke Rate: The average number of strokes per minute (spm) during the current activity.
		Source: (Garmin Venu 3 Owner's Manual, p.79)